3.10 Science Data Archival Activities

3.10.1 Startup of a New Data Server Scenario (Nominal)

3.10.1.1 Scenario Description

The startup and shutdown scenarios rely on a command from the MSS supplied SNMP Agent to load Unix OS followed by applications and/or COTS software on each of the subsystem's host computers. The agent insures each host's Unix OS has reached a quiescent state, and then startup scripts are initiated to start the COTS software database product Sybase and the DSS Overall System Management (DSS-OSM) applications process. Sybase may be used to store some persistent data and configuration parameters for CSCI's within the subsystem.

The operator logs into DSS-OSM using the *DSS System Login Dialog Screen* the operator is automatically moved to the *System State Screen* to view the current state of all DSS CIs. The operator may alter the configuration of the system by pulling down the *Other Screens Menu* and accessing Configuration. This places the operator at the *Configuration Database* where system changes can be made. This database will either be in a series of flat files or in the Sybase RDBMS. (This scenario assumes no configuration changes.)

At the *System State Screen* the operator may selectively start CIs or if no CIs are active the operator may click *Startup* to automatically start the DSS. Note: If the operator chooses to selectively start individual CIs he will be alerted that other CIs with dependency relationships, have not been started. (e.g., If the operator attempts to first start Science Data Server, he will be told that SYBASE is not started, etc.) The operators is not precluded from starting individual CIs, but some services will be unavailable if some CIs are *Down.*

Assuming the operator proceeds with normal startup, the CSCIs and COTS products are started in the following order. AMASS is started, completes an internal database test, and begins a quick inventory of the volumes managed by the archive to identify physical discrepancies. Storage Management is the first CSCI to start since other Data Server Subsystem (DSS) CSCI's rely on Storage Resource Management process to access some shared resources (e.g., working storage.) Document Data Server Starts next. This essentially brings up a Web Server COTS Product. Distribution Management then starts and insures it has access to the available physical devices. Science Data Server starts and insure communication to internal subsystem and external entities. Post startup equipment status is collected and forwarded to MSS. For shutdown, new requests and searches are suspended. Database updates are completed, and sessions are checkpointed, disconnected and stored. The startup process is described in Table 3.9.4-1. The operator may examine the status and progress of the startup sequence by pulling down the *Other Screens* (*Overall Screens*) option and selecting *Logs & Reports (MSS).*

3.10.1.2 Frequency

There is no routine schedule for startup or shutdown. This service is performed on an ad hoc or as required basis. The frequency of start up and shut down is driven by a number of factors. One of these factors is based in DAAC policy decisions at the DAACs where the system is not planned to be operational in a 7x24. Another factor is the anticipated system failure rate based on hardware

faults. These type failures are captured in the RMA work done by the program. Both these factors are being brought together in the end to end modeling/infrastructure DIT work that is ongoing. The assumption for this version of the document is that start up and shutdown are done an average of once a week per subsystem. This average would encompass all PM, RM, and fault clearing conditions.

3.10.1.3 Assumptions

This scenario assumes that an SNMP Agent will be available for the DSS host processors to manage system startup activities. The Data Server utilizes the functionality provided by the CSS and MSS groups with regards to SNMP control. We are working with the vendors of the robotics and drives to make their equipment fully SNMP manageable. The level of control at this point is limited to process start up and shutdown and does not extend to the hardware.

3.10.1.4 Components

The Data Server Startup process will rely on the hardware and software indigenous to the DSS and MSS Logging & Report Services. Figure 3.10.1.4-1 represents the data server subsystems primary components.

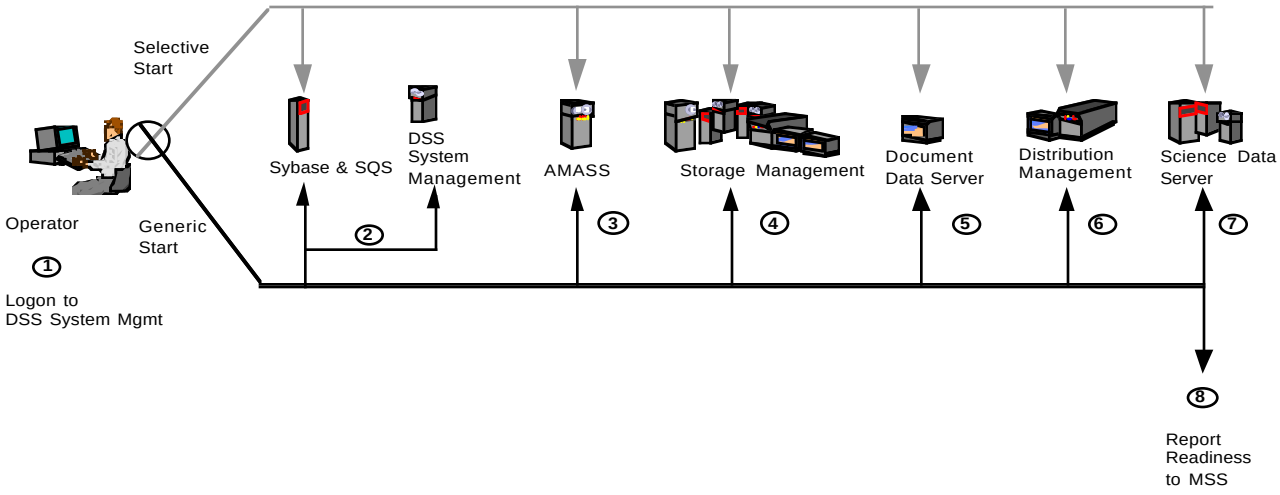

Figure 3.10.1.4-1. Startup of a New Data Server Scenario (Nominal) Components

3.10.1.5 Preconditions

No specific preconditions are required other than all applications software, COTS products and operating systems should be shutdown. Hardware may or may not be powered down. MSS has issued a startup message via the SNMP agents on all DSS hosts processors. All hardware has powered up normally and all Unix Operating Systems have reached a quiescent state.

3.10.1.6 Detailed Steps of the Process

Table 3.10.1.6-1 represents the details of this scenario. The times and duration given are approximate.

Table 3.10.1.6-1. Startup of a New Data Server Scenario (Nominal) Process (1 of 2)

Step	Est[1] Time	Operator/ User	System	Purpose	Figure
1	1 min	Operators may login to the Unix Host directly and view *errlog* and other Unix logs at any time.	Software startup sent via SNMP to Data Server hosts.	MSS initiates the Data Server Startup sequence.	
2	4 - 7 min	Operator signs on via the *DSS System Login Dialog* Screen and is transferred to the *System State* Screen. The operator clicks *Startup*.	The COTS Metadata Management product is started along with the DSS Overall System Management.	Initialize COTS product. (Some Data Server persistence data may be stored in the metadata management product). Start DSS-OSM.	3.10.1.6-1 3.10.1.6-2
3	4 - 7 min[2]		The AMASS COTS product is started.	AMASS software starts, performs internal consistency checks and inventories the archive robotics.	
4	1 - 9 min	The operator will see the state of each CSCI or COTS product change from *Down* to *Active* on the *System State* Screen when component initialization is completed.	Standalone Storage Resource Management processes are started. One for each resource type. (network, staging disk, tape, CD ROM) Staging Monitor and Pull Monitor started.	Storage Management start and check physical devices after metadata COTS product finishes.	3.10.1.6-2

[1]Note: these are estimated times at present. No granularity of less than a minute is provided though some requests will likely take only seconds to process.

[2]A present this number does not include a full audit of the contents of the archive. This service is provided by the AMASS software and can be invoked at any time, but the vendor has not yet provided definitive estimates of the time this function will take.

Table 3.10.1.6-1. Startup of a New Data Server Scenario (Nominal) Process (2 of 2)

Step	Est[3] Time	Operator/ User	System	Purpose	Figure
5	2 - 5 min	The operator may examine the progress of *Down* CSCI by pulling down the *Other Screens* option and selecting *Logs & Reports (MSS).*	Web-based software started on the DDSRV host.	Document Data Server Starts.	3.10.1.6-3
6	1 - 5 min		Distribution Server process is started in standalone mode.	Data Distribution starts.	
7	1 - 7 min		Science Data Server and Subscription Server processes are started in standalone mode.	Data Server Starts.	
8	1 - 5 min	At this point the operator will see the state of all CSCIs and COTS products is *Active.*	A status message is provided to MSS detailing available and unavailable equipment via the MSS API.	Report subsystem readiness to MSS.	3.10.1.6-2

3.10.1.7 Postconditions

The Data Server is now ready for normal operations.

[3]Note: these are estimated times at present. No granularity of less than a minute is provided though some requests will likely take only seconds to process.

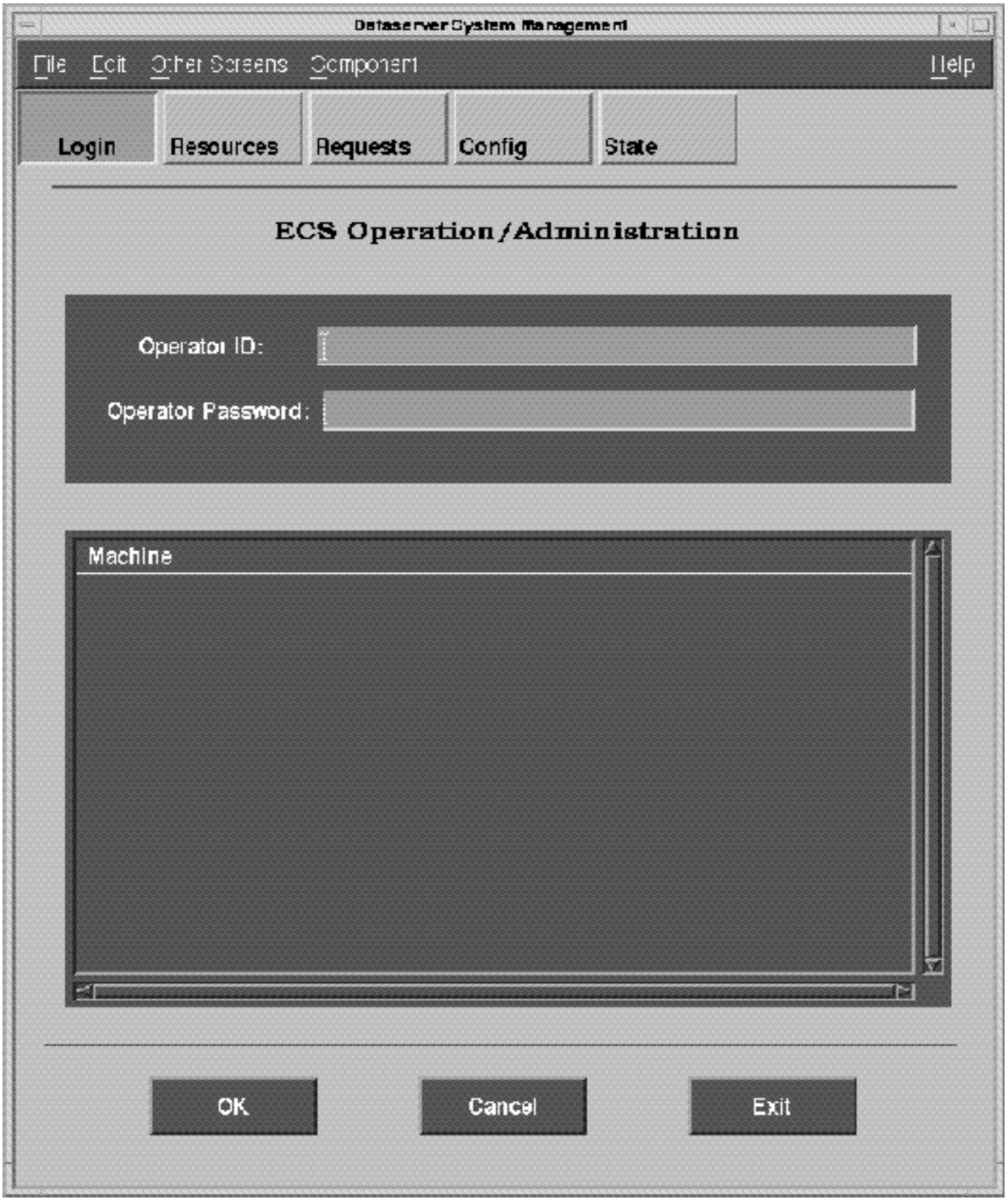

Figure 3.10.1.6-1. DSS System Management - Login

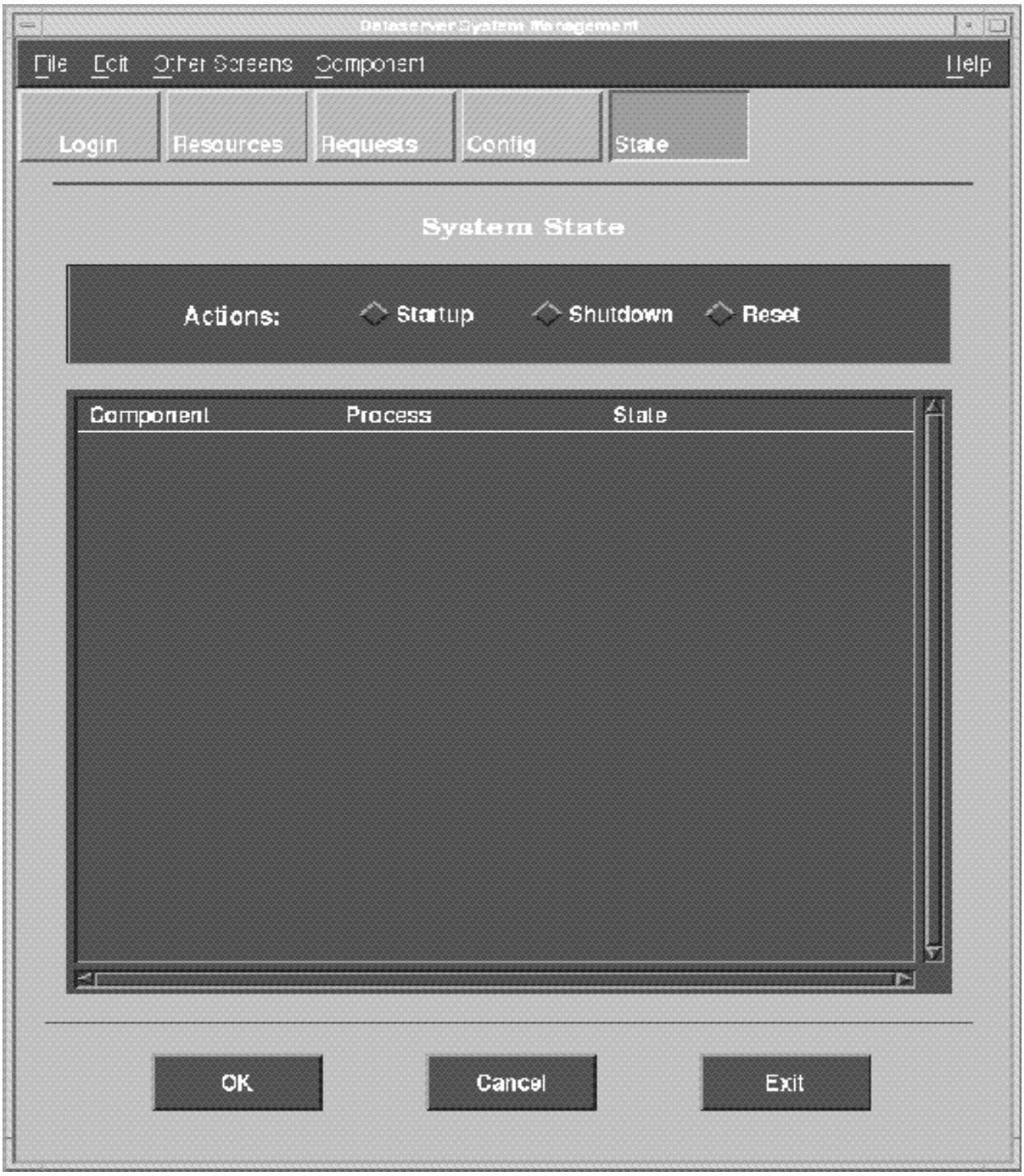

Figure 3.10.1.6-2. DSS System Management - System State

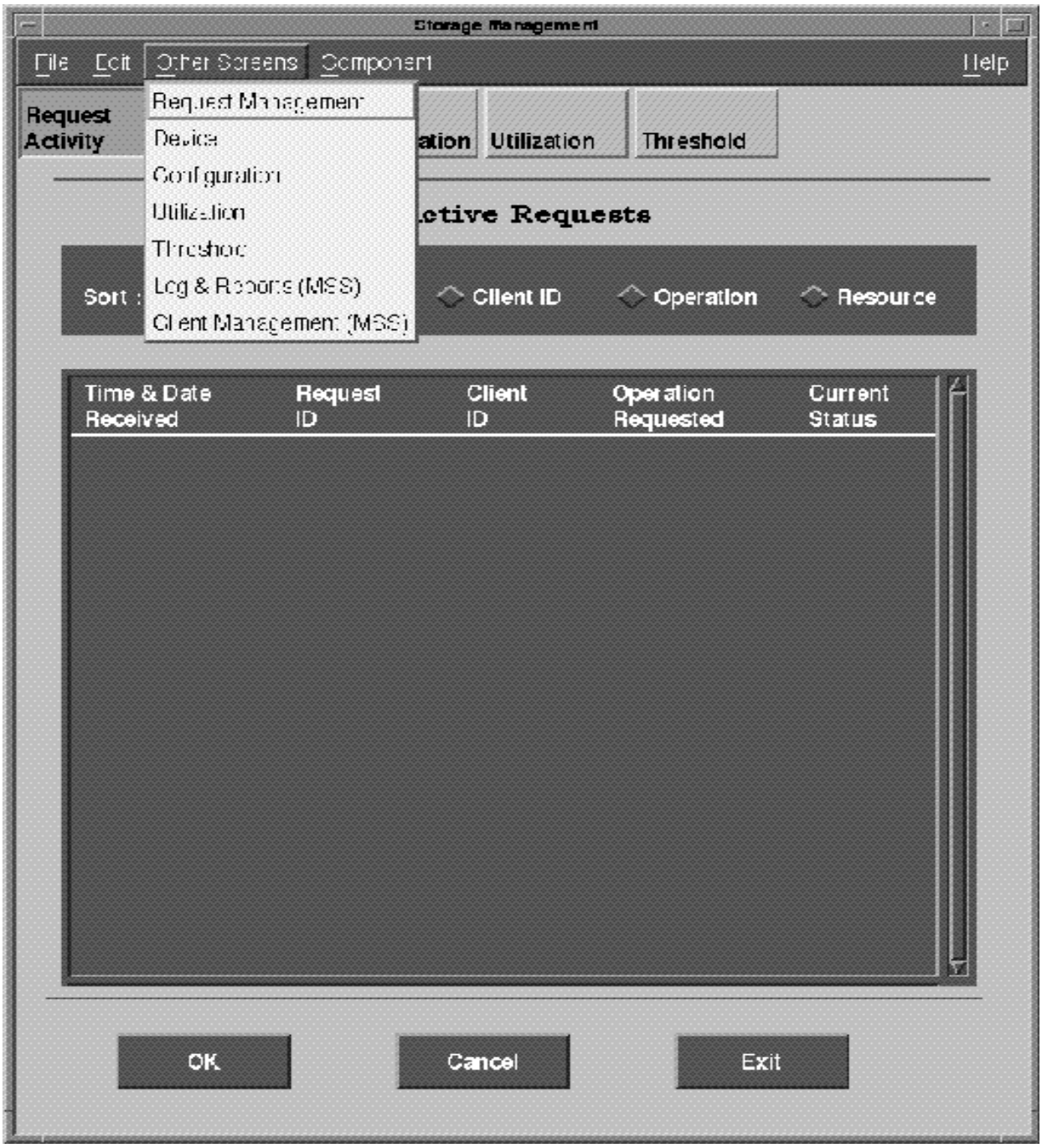

Figure 3.10.1.6-3. DSS System Management - Other Screens - Logs and Reports (MSS)

3.10.2 Data Insertion Scenario (nominal)

3.10.2.1 Scenario Description

This scenario describes the insertion of data into a Data Server at an ECS DAAC. This process is largely automated with validation errors being manually processed by the QA staff. Operations personnel can monitor insert activity by pulling down the *Other Screens* option and selecting *Logs & Reports (MSS)*. Data and associated metadata can be received from numerous sources including: the Ingest Subsystem, the Processing Subsystem, other DAACs, and Users. This scenario will focus on a data insert from the Processing Subsystem. The validation, insertion, and subscription processing process is described in Table 3.9.1.6-1.

3.10.2.2 Frequency

There is no routine schedule for data insertion requests. An insert request most often occurs whenever data is prepared by the Processing subsystem, or when an operator initiates the service, or any other authorized entity has data for storage. Based on the IDR-B modeling runs, the following is an initial estimate of Processing subsystem insert frequency. (Note that this is an automated process that does not normally require operator interaction.) These numbers also represent data base updates for each granule.

DAAC	Number of Data Server Inserts Per Day (from processing only)
GSFC	4,838
EDC	2,000
JPL	45
LaRC	630
NSIDC	811

3.10.2.3 Assumptions

This scenario assumes all components are *Active* and not in any degraded modes of operations. It further assumes that appropriate media data classes have been added to the Data Repository, that Data Type Services exist for the ingestion of the data (i.e. This scenario describes a routine ingestion of data for an established ESDT data collection.), and the Data Server's nominal activity rate is 50% of capacity. Note that we have only included those sites where ECS has the responsibility for both processing and data storage.

3.10.2.4 Components

This scenario involves many components of the Data Server. These included the Working Storage HWCI, Science Data Server, MD CSC (Sybase), Storage Management, FMS CSC (AMASS), the Data Repository HWCI, the Subscription Server, and MSS Logging & Report Services. Figure 3.10.2.4-1 represents the data server and MSS components utilized in an insert request.

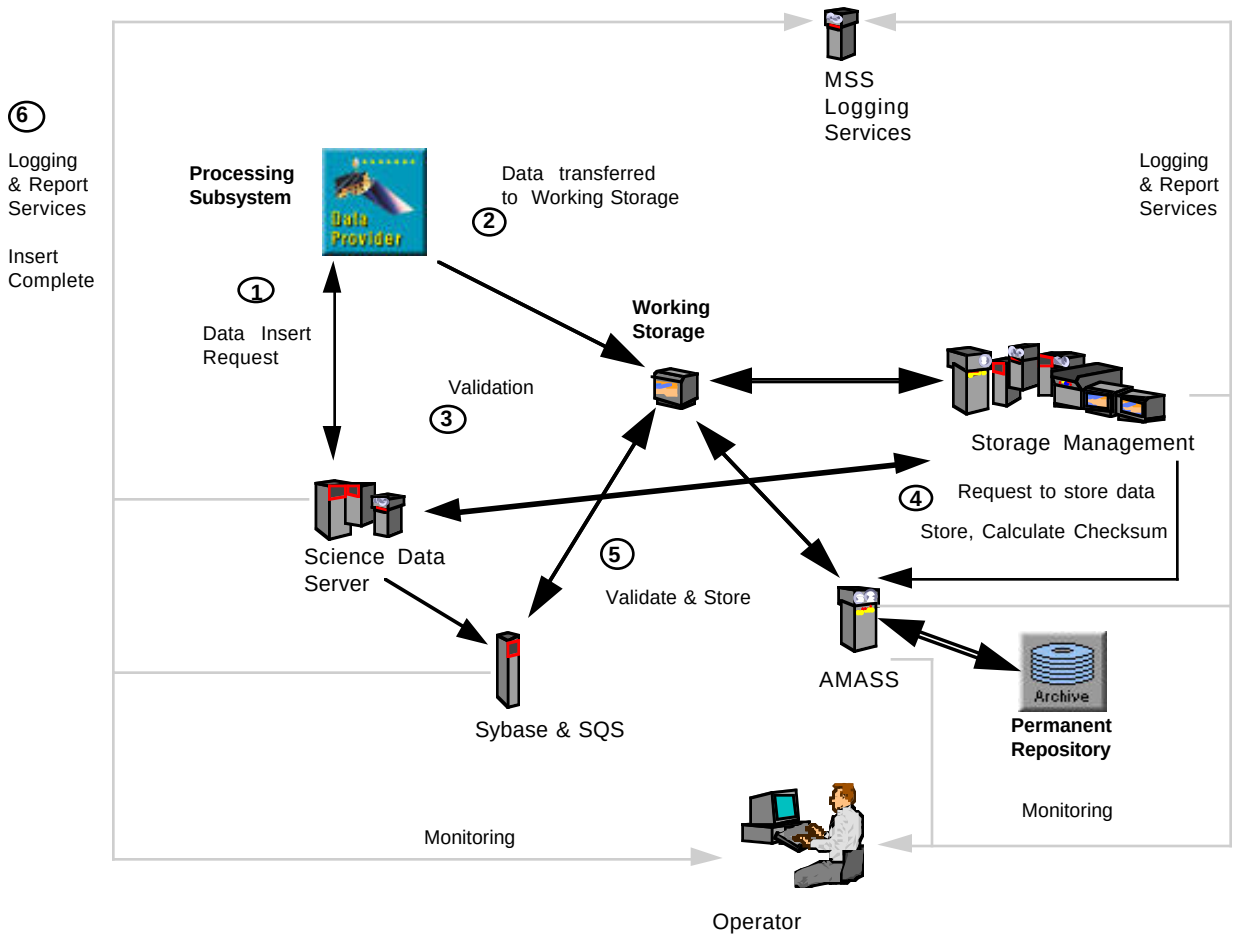

Figure 3.10.2.4-1. ata Insertion Scenario (nominal) Components

3.10.2.5 Preconditions

Though it is not specifically necessary the operator may check the *Request Dialog* Screen for Active Requests in Storage Management to identify request that will be processed before the data insert. In addition the operator may query the *Device Info Dialog* Screen to insure Data Repository devices and components are fully functional.

3.10.2.6 Detailed Steps of the Process

Table 3.10.2.6-1 represents the details of this scenario. The times and duration given are approximate.

Table 3.10.2.6-1. Data Insertion Scenario (nominal) Process (1 of 3)

Step	Est[1] Time	Operator/User	System	Purpose	Figure
1	1 - 5 min	The operator may examine the progress of a request by pulling down the *Other Screens* option in the DSS-OSM and selecting *Logs & Reports (MSS)* to browse the log files provided by MSS.	The Processing Sub-system sends a Data Insert Request to the Science Data Server. Receipt of the Request is logged (via MSS Logging Services), and a request identifier is associated with the Data Insert Request. The content of the request is validated. Validation failure results in a rejection message. Validation success results in the request being queued for later processing.	Initiate session between the Processing Sub-system and a Data Server.	3.10.2.6-1.
2	1 - x min[2]	The Operator may check request status at any time using the DSS-OSM *Request Screen.*	The queued Data Insert Request is reached and processing begins. Associated data granules and metadata are transferred from the Processing Subsystem to the Data Server working storage. Data transfer status (including recoverable errors) are indicated in the event log (via MSS Logging Services).	Transfer data from a Processing Sub-system to a Data Server.	3.10.2.6-2
3	1 - x min[3]		The metadata update file(s) produced by the associated data product PGEs are validated for completeness and correctness. Validation success or failure is logged (via MSS Logging Services) with the associated Data Insert Request Identifier and the appropriate status message is returned to the Processing Subsystem.	Validate metadata received from the Processing Subsystem.	

[1]Note: these are estimated times at present. No granularity of less than a minute is provided though some requests will likely take only seconds to process.

[2]Transfer time is dependent upon the number and size of the files associated with both the granules and the metadata in the Data Insert Request.

[3]Validation time is dependent upon the number and size of the metadata files associated with the Data Insert Request.

Step	Est[4] Time	Operator/User	System	Purpose	Figure
4	1 - x min[5]	The operator may view the Storage Management *Archive Activity Log* Screen and the *Inventory Update Dialog* Screen to follow the progress of the data storage operation.	Upon successful validation of the metadata update file, Science Data Server sends a Data Storage Request to Storage Management. The data granules in working storage associated with the Data Storage Request are stored. The Archive Activity Log (via MSS Logging Services) records each data product being stored and storage status of each storage operation. A checksum value is calculated for each data object associated with each granule. The checksum value, storage status, and other selected metadata is forwarded to the Science Data Server in a status message upon completion of the Data Storage Request.	Store data granules in the permanent archive.	3.10.2.6-3. 3.10.2.6-4
5	1 - x min[6]	The operator may examine the progress of the insert by pulling down the *Other Screens* option in the DSS-OSM and selecting *Logs & Reports (MSS)* to browse the log files provided by MSS.	Science Data Server receives and logs (via MSS Logging Services) the Data Storage Request status message from Storage Management. The additional metadata items are validated. The PGE produced metadata update file and the storage management provided metadata are loaded into the metadata database. The status of the metadata load is entered in the event log (via MSS Logging Services).	Store metadata.	3.10.2.6-1

[4]Note: these are estimated times at present. No granularity of less than a minute is provided though some requests will likely take only seconds to process.

[5]The storage and checksum calculation processing time will vary greatly depending on the size and number of files in the Data Storage Request.

[6]The storage and checksum calculation processing time will vary greatly depending on the size and number of files in the Data Storage Request.

6	1 min		The Science Data Server logs (via MSS Logging Services) completion of the Data Insert Request in the event log and reports completion of the Data Archive Manager, the operator console and to the insert Requestor (the Processing Subsystem in this case). Each of the above entities would also be notified if the request failed and reason(s) for failure is/are identified.	Report Data Insert Request Status.	

Step	Est[7] Time	Operator/User	System	Purpose	Figure
7	1 - x min[8]	The operator may review the progress on subscription processing by *SSDRV Main Window* Screen and selecting *Subscription Man-agement* sub-screen button.	The Science Data Server will then examine the event list for all subscriptions for that event. Subscription notifications are sent to the appropriate entities as appropriate and distribution processing is initiated. The Science Data Server sends an Advertisement Update Message to the Advertisement Server to advertise the new data.	Process subscriptions based on newly inserted data.	3.10.2.6-5

[7]Note: these are estimated times at present. No granularity of less than a minute is provided though some requests will likely take only seconds to process.

[8]The time required for subscription notification will vary greatly depending on the number of subscriptions that exist for the newly inserted data.

3.10.2.7 Postconditions

Subscription processing may continue for some time after the data insertion request has been completed.

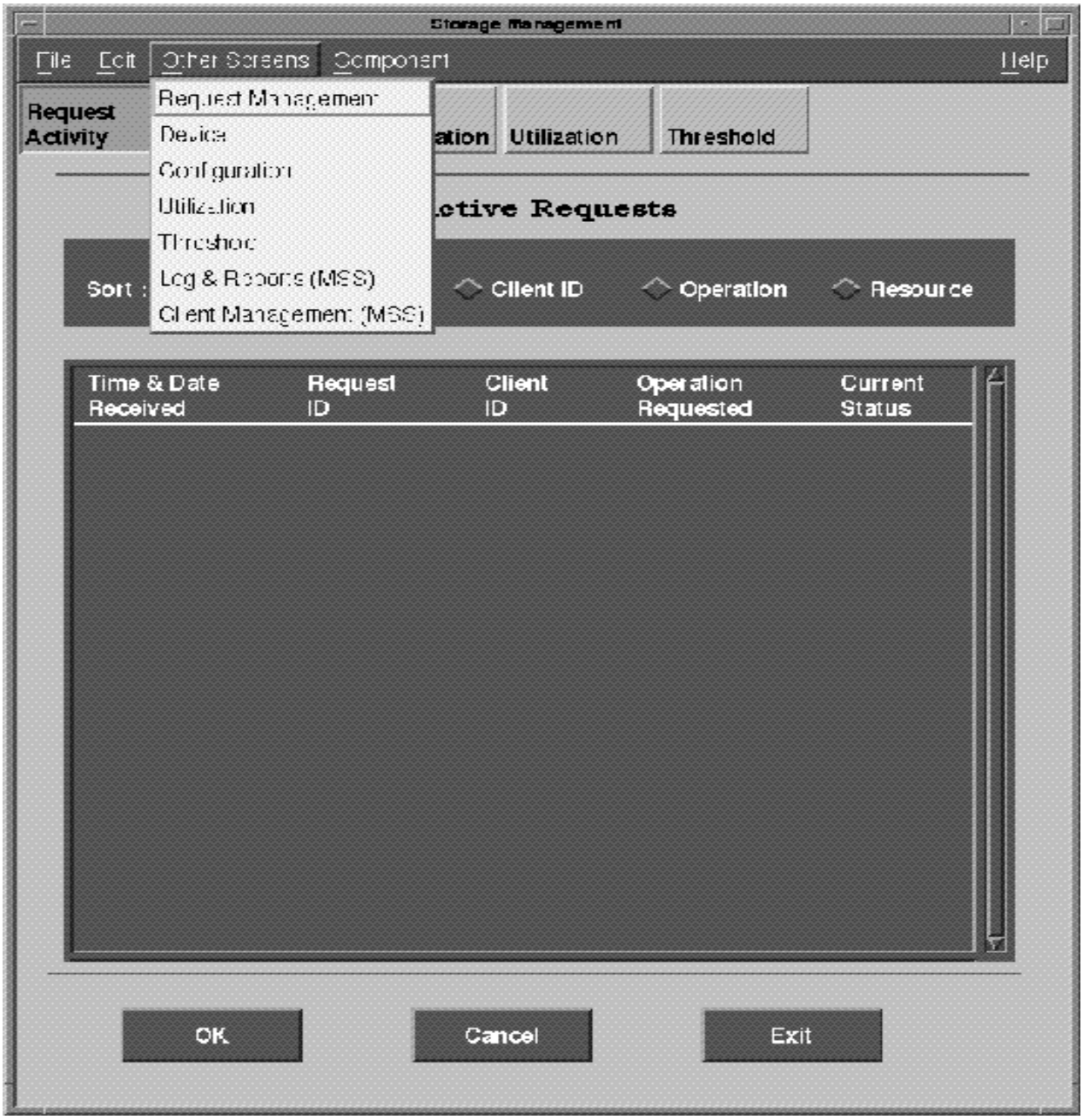

Figure 3.10.2.6-1. DSS System Management - Other Screens - Logs and Reports (MSS)

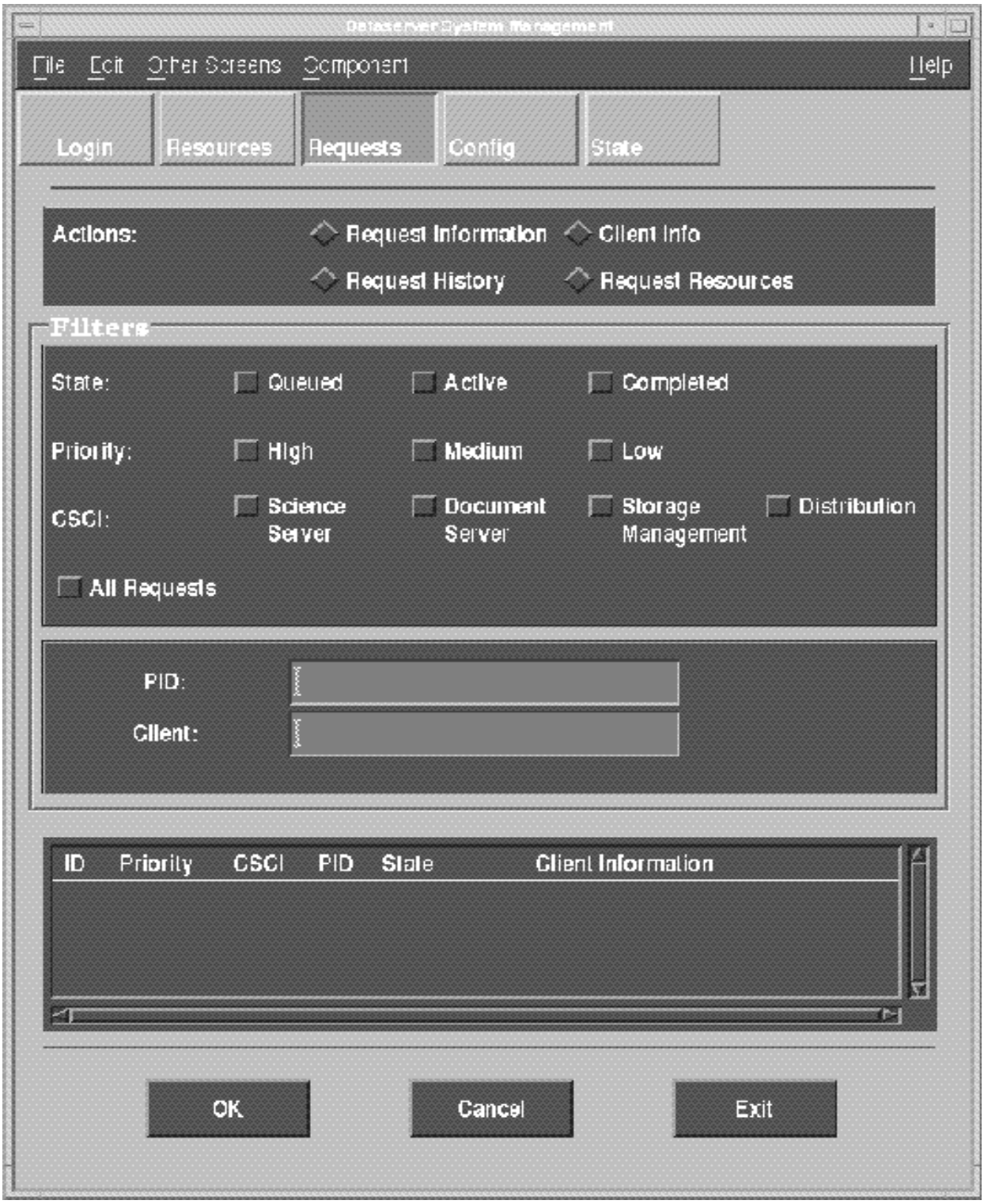

Figure 3.10.2.6-2. DSS System Management - Request

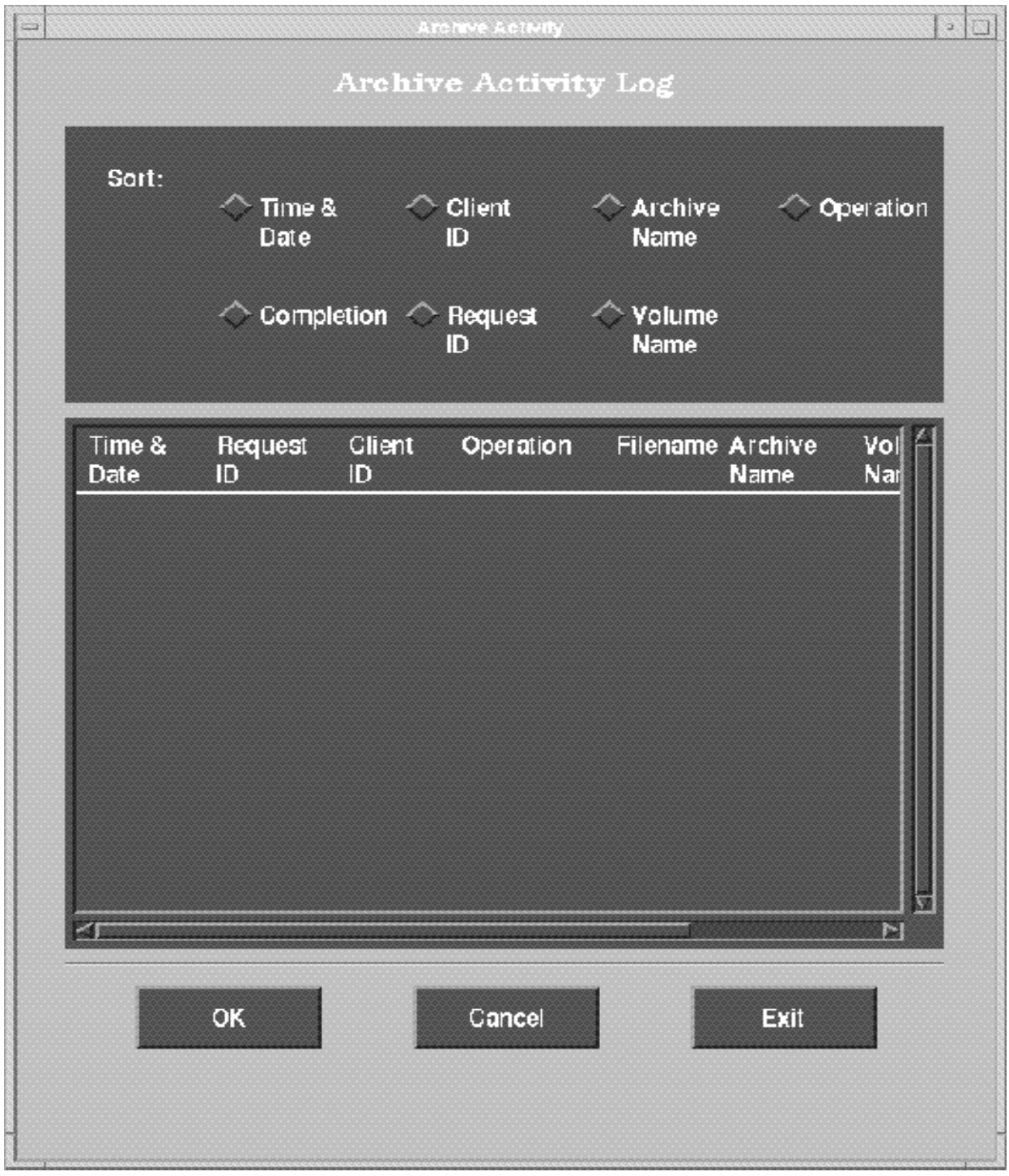

Figure 3.10.2.6-3. Storage Management - Archive Activity Log

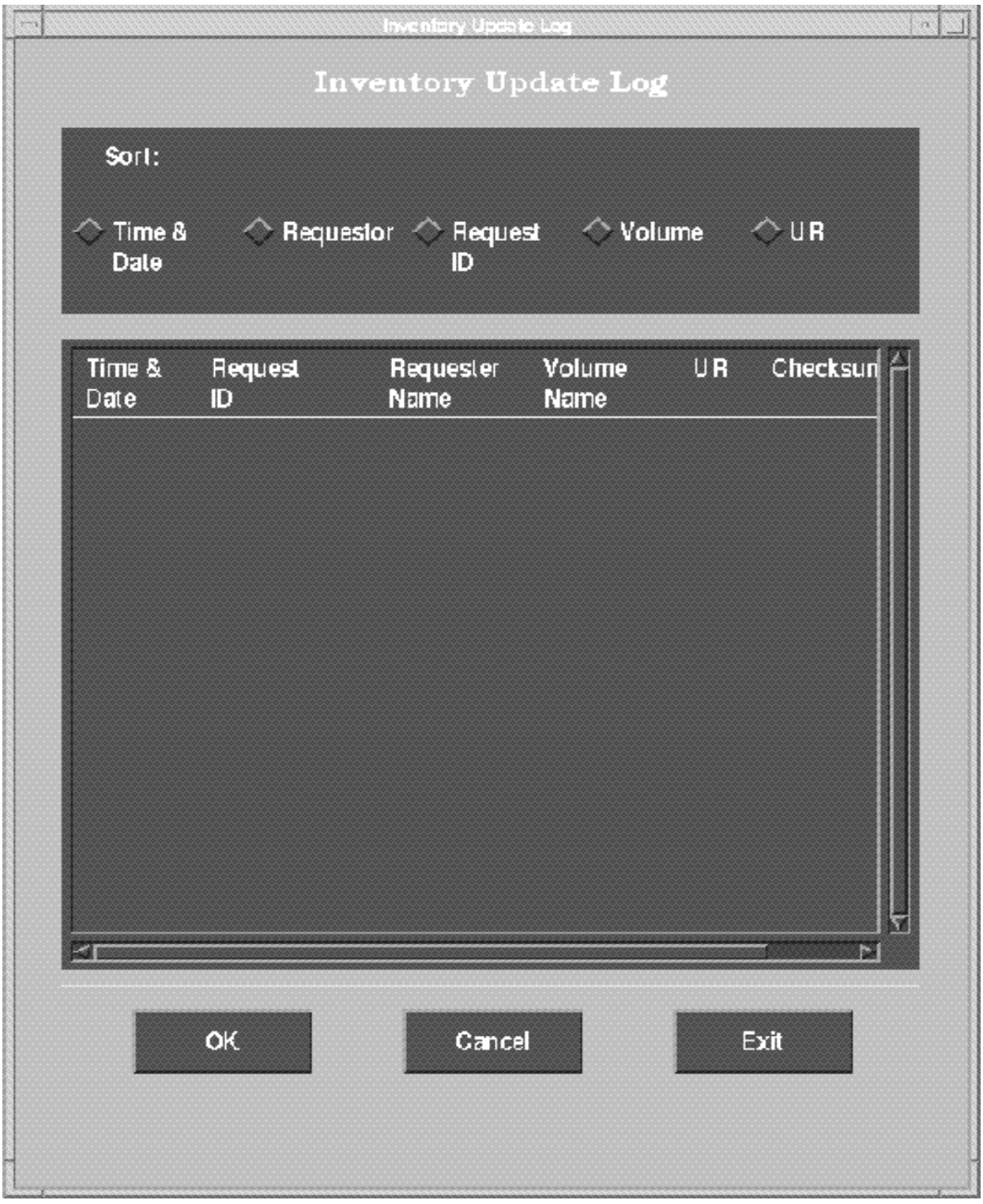

Figure 3.10.2.6-4. Storage Management - Archive Inventory Update

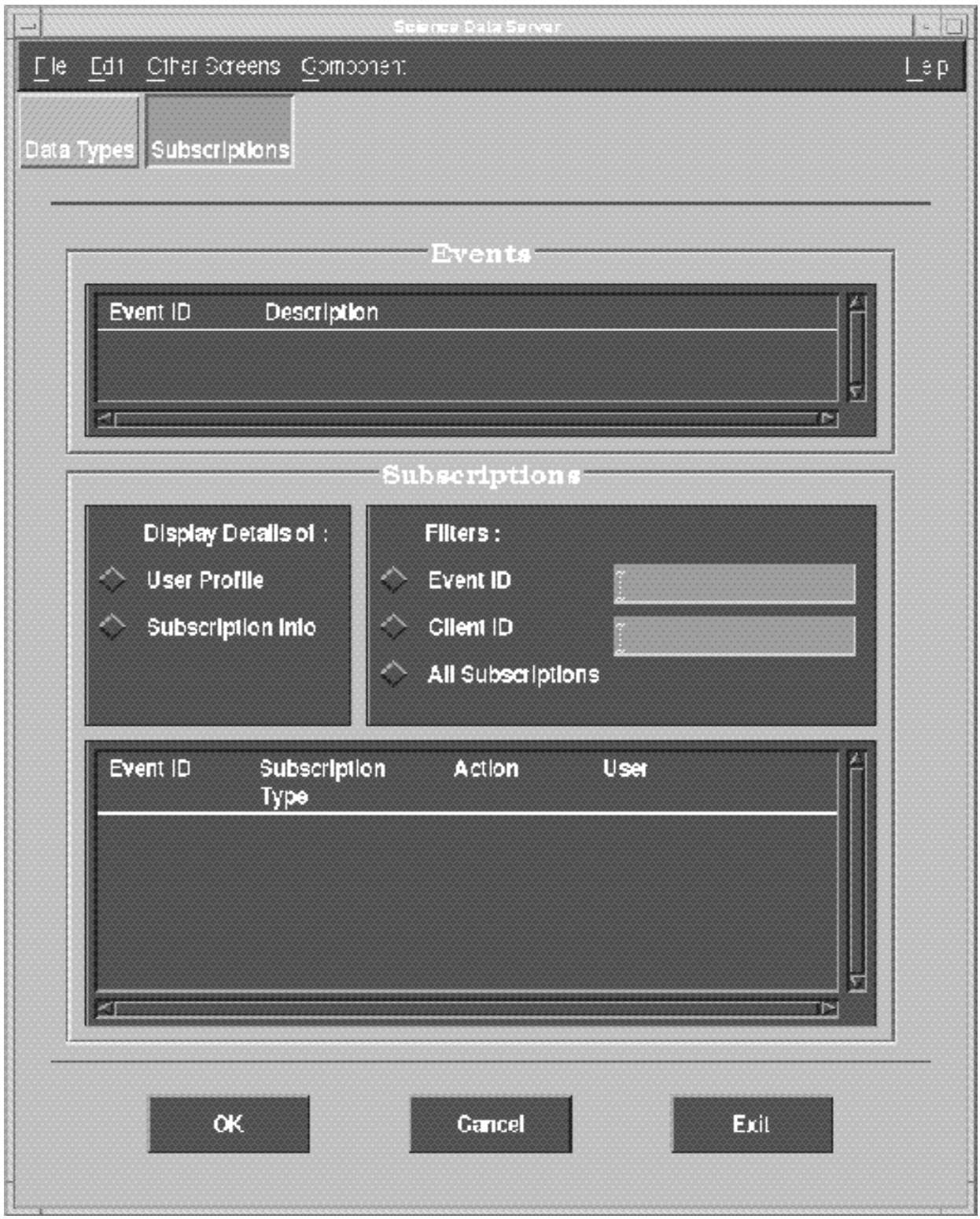

Figure 3.10.2.6-5. Science Data Server - Subscription Button

3.10.3 Data Insertion Scenario (fault)

3.10.3.1 Scenario Description

This scenario describes the insertion of data into a Data Server at an ECS DAAC and the sequence of events when a fault occurs. This process is largely automated with validation errors being manually processed by the QA staff. Data and associated metadata can be received from numerous sources including: the Ingest Subsystem, the Processing Subsystem, other DAACs, and Users. This scenario will focus on a data insertion and fault processing from the Processing Subsystem. The validation, insertion, and subscription fault processing procedures are described in Table 3.10.3.6-1.

3.10.3.2 Frequency

This scenario occurs whenever an error is encountered during a Data Insertion Scenario. A factor driving this frequency is the anticipated system failure rate based on hardware faults. These type failures are captured in the RMA work done by the program. The second factor is faulty data. Both these factors are being brought together in the end to end modeling/infrastructure DIT work that is ongoing.

Data transfer durations are a function of the specific file/granule. Interested readers should refer to the ECS Performance Modeling report for information of data transfer times. A full discussion of the specifics on Mean Down Time, Mean Time to Restore, and other maintenance response times are documented in the ECS System RMA Analysis report. According to current RMA analysis we are projecting a 142 day MTBF on the archive function.

3.10.3.3 Assumptions

An authorized user (in this case, the Processing Subsystem) initiates a data transfer session by sending a Data Insert Request. All hardware and software components are fully functional at the start of the scenario and the Subsystem load is medium.

3.10.3.4 Components

This scenario can potentially involve many of the Data Server's components depending on where the fault occurs. These components include: The Working Storage HWCI, Science Data Server, MD CSC (Sybase), Storage Management, FMS CSC (AMASS), the Data Repository HWCI, the Subscription Server, and MSS Logging & Report Services. Figure 3.10.3.4-1 represents the data server and MSS components utilized in an insert request.

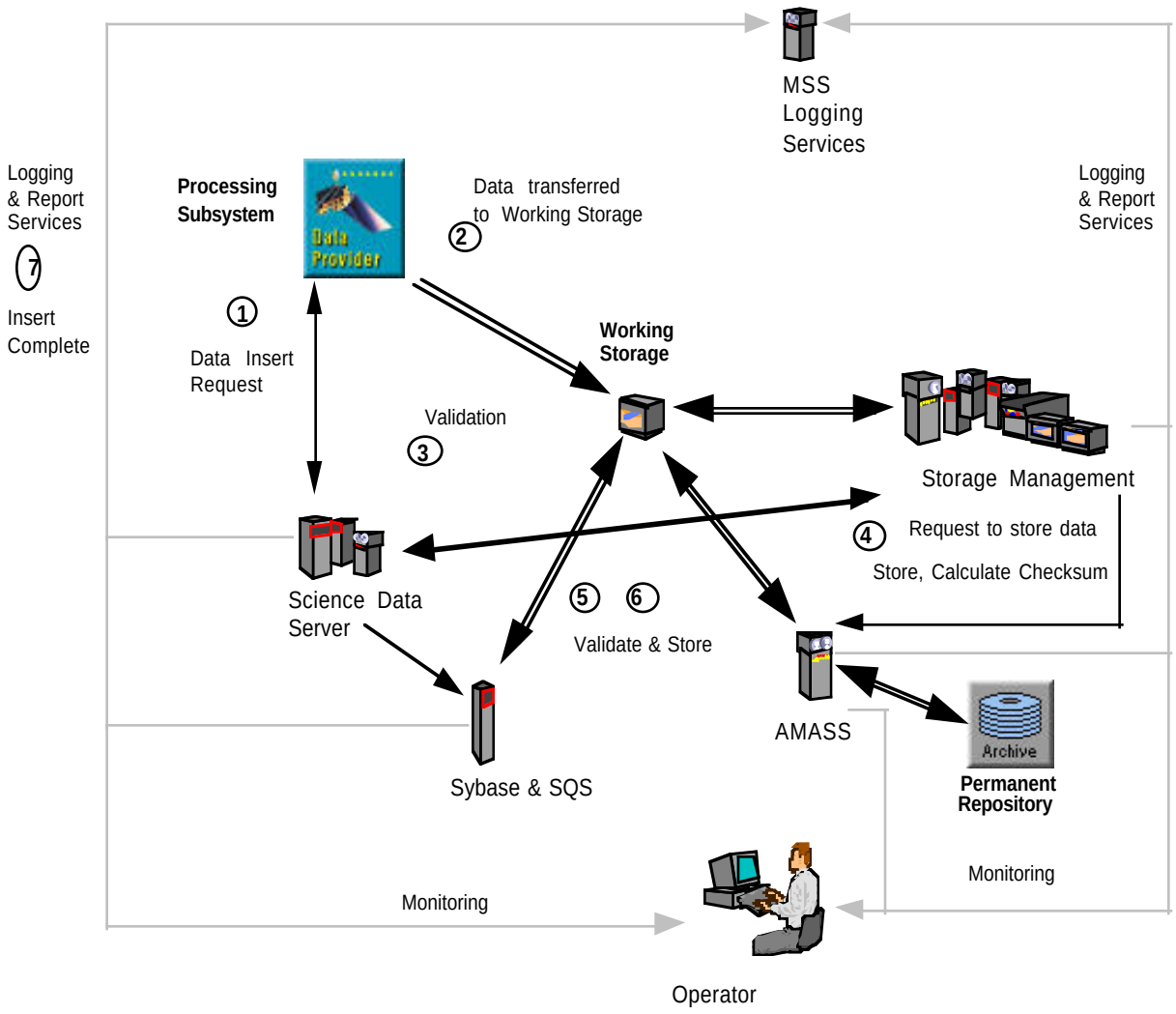

Figure 3.10.3.4-1. Data Insertion Scenario (fault) Components

3.10.3.5 Preconditions

None.

3.10.3.6 Detailed Steps of the Process

Table 3.10.3.6-1 represents the details of this scenario. The times and duration given are approximate.

Table 3.10.3.6-1. Data Insertion Scenario (fault) Process (1 of 7)

Step	Est[1] Time	Operator/ User	System	Purpose	Figure
1	1 - 5 min	The operator may examine the progress of requests and view specific errors by pulling down the *Other Screens* option and selecting *Logs & Reports (MSS).*	The Processing Subsystem sends a Data Insert Request to the Science Data Server. Receipt of the Request is logged (via MSS Logging Services), and a request identifier is associated with the Data Insert Request and the request is queued.	Initiate session between the Processing Sub-system and a Data Server.	3.10.3.6-1
2	1 - x min[2]	The Operator may review the progress of a request using the DSS System Man-agement *Request* Screen.	The queued Data Insert Request is reached and processing begins. Associated data granules and metadata are transferred from the Processing Subsystem to the Data Server working storage. Data transfer status (including recoverable errors) are indicated in the event log (via MSS Logging Services).	Transfer data from a Processing Sub-system to a Data Server.	3.10.3.6-2
3	1 - x min[3]	The operator may examine the progress of requests and view specific errors by pulling down the *Other Screens* option and selecting *Logs & Reports (MSS).*The Operator may review the progress of a request using the DSS System Management *Request* Screen.	The metadata update file(s) produced by the associated data product PGEs are validated for completeness and correctness.	Validate metadata received from the Processing Subsystem.	3.10.3.6-1 3.10.3.6-2

[1]Note: these are estimated times at present. No granularity of less than a minute is provided though some requests will likely take only seconds to process.

[2]Transfer time is dependent upon the number and size of the files associated with both the granules and the metadata in the Data Insert Request.

[3]Validation time is dependent upon the number and size of the metadata files associated with the Data Insert Request.

Step	Est[4] Time	Operator/ User	System	Purpose	Figure
3a	1 - 3 min		Validation failure results in an error message being logged in the event log (via MSS Logging Services) and a rejection message being sent to the requestor[5]. The rejection message is entered in the event log and for-warded to the Data Archive Manager and the operator[6]. The rejection message and the metadata update file(s) are forwarded to QA for evaluation and correction. The Data Insert Request is closed and the Data Insert Session is terminated.	Validation Failure... Request rejected.	
3b	1 min		Validation success results in Science Data Server sending a Data Storage Request to Storage Management.	Validation Success.	

[4]Note: these are estimated times at present. No granularity of less than a minute is provided though some requests will likely take only seconds to process.

[5]This is the capability provided in Release A.

[6]At a minimum, errors and alarms will be logged and sent to the operator console. Additional routing capabilities, if any, must be provided by MSS Logging Services.

Step	Est[7] Time	Operator/ User	System	Purpose	Figure
4	1 - x min[8]	The operator can track progress and review any errors recorded by using either the *Other Screens* option and selecting *Logs & Reports (MSS)* from DSS System Management main menu or via the Storage Management Component's *Logs & Reports (MSS)* submenu available on the *Other Screens* pull down menu. The operator may track the progress of an insert request from a Storage Management perspective using the *Archive Activity Log* and/or the *Archive Inventory Update* Screens.	The data granules in Working Storage associated with the Data Storage Request are stored. The Archive Activity Log records (via MSS Logging Services) each data product being stored and storage status of each storage operation.	Store data granules in the permanent archive.	3.10.3.6-1 3.10.3.6-6 3.10.3.6-3 3.10.3.6-4
4a	1 - 3 min		Storage failure results in an error message being logged in the event log (via MSS Logging Services), and request status change to OPINT. The operator is notified of the problem. (The most likely reason for a storage failure at this point is a physical hardware problem.)	Storage Failure... Operator Intervention Required.	

[7]Note: these are estimated times at present. No granularity of less than a minute is provided though some requests will likely take only seconds to process.

[8]The storage and checksum calculation processing time will vary greatly depending on the size and number of files in the Data Storage Request.

Step	Est[9] Time	Operator/ User	System	Purpose	Figure
4b	1 - x min[10]	The operator reviews the error message using the DSS System Management *Other Screens* option and selecting *Logs & Reports (MSS).* The operator must take whatever corrective action is appropriate for the problem. Once the problem is resolved The operator may resume the request using the DSS System Management *Request* Screen and pressing the *Resume* Button (not shown.)		Operator and/or maintenance corrects the problem.	3.10.3.6-1 3.10.3.6-2
4c	1 - 2 min		The checksum value, storage status, and other selected metadata is forwarded to the Science Data Server in a status message upon completion of the Data Storage Request.	Storage Success.	

[9]Note: these are estimated times at present. No granularity of less than a minute is provided though some requests will likely take only seconds to process.

[10]The time required to correct the problem is dependent upon the nature of the problem, availability of parts, etc.

5	1 - 3 min	The operator can track progress and review any errors recorded by using either the *Other Screens* option and selecting *Logs & Reports (MSS)* from DSS System Management main menu or via the Science Data Server Component's *Logs & Reports (MSS)* submenu available on the *Other Screens* pull down menu.	Science Data Server receives and logs (via MSS Logging Services) the Data Storage Request status message from Storage Management. The additional metadata items are validated.	Store metadata.	3.10.3.6-1 3.10.3.6-7

Step	Est[11] Time	Operator/ User	System	Purpose	Figure
5a	1 - 3 min		Validation failure results in an error message being logged in the event log (via MSS Logging Services), and request status change to OPINT. The operator is notified of the problem.		
5b	1 - x min[12]	The operator reviews the error message using the DSS System Management *Other Screens* option and selecting *Logs & Reports (MSS).* The operator must take whatever corrective action is appropriate for the problem. Once the problem is resolved The operator may resume the request using the DSS System Management *Request* Screen and pressing the *Resume* Button (not shown.)		Operator corrects the problem.	3.10.3.6-1 3.10.3.6-2

[11]Note: these are estimated times at present. No granularity of less than a minute is provided though some requests will likely take only seconds to process.

[12]The operator may need to utilize DSS tools and a Unix editor to correct errors and fill in missing data in the Storage Management Checksum & metadata files. It is unknown how long this process will take.

6	1 - x min[13]		The PGE produced metadata update file and the storage management provided metadata are loaded into the metadata database. The status of the metadata load is entered in the event log.	Validation Success.	

[13]The time required to insert metadata into the database is dependent upon the number of entries that must be processed.

Step	Est[14] Time	Operator/ User	System	Purpose	Figure
6a			Load failure results in an error message being logged in the event log (via MSS Logging Services), and request status change to OPINT. The operator is notified of the problem.	Metadata Load Failure.	
6b	1 - x min[15]	The operator reviews the error message using the DSS System Management *Other Screens* option and selecting *Logs & Reports (MSS).* The operator must take whatever corrective action is appropriate for the problem. Once the problem is resolved The operator may resume the request using the DSS System Management *Request* Screen and pressing the *Resume* Button (not shown.)		Operator corrects the problem.	3.10.3.6-1 3.10.3.6-2

[14]Note: these are estimated times at present. No granularity of less than a minute is provided though some requests will likely take only seconds to process.

[15]The operator must track the events through the event log to determine the actual problem. The operator must the correct the problems using the GUI-based COTS tools provided by Sybase and AMASS. It is unknown how long this process will take.

Step	Est[16] Time	Operator/ User	System	Purpose	Figure
7	1 min	The operator can track progress and review any errors recorded by using either the *Other Screens* option and selecting *Logs & Reports (MSS)* from DSS System Management main menu or via the Science Data Server Component's *Logs & Reports (MSS)* submenu available on the *Other Screens* pull down menu.	The Science Data Server logs (via MSS Logging Services) completion of the Data Insert Request in the event log and reports completion of the Data Insert Request to the operator console and to the insert Requestor (the Processing Subsystem in this case).	Metadata load success. Report Data Insert Request Status.	3.10.3.6-1 3.10.3.6-7
8	1 - x min[17]	The operator may review/track the progress of subscriptions by clicking the *Subscriptions button* to reach the *Subscription Management* Screen.	The Science Data Server will then examine the event list for all subscriptions for that event. Subscription notifications are sent to the appropriate entities as appropriate and distribution processing is initiated.	Process subscriptions based on newly inserted data.	3.10.3.6-5

[16]Note: these are estimated times at present. No granularity of less than a minute is provided though some requests will likely take only seconds to process.

[17]The time required for subscription notification will vary greatly depending on the number of subscriptions that exist for the newly inserted data.

3.10.3.7 Postconditions

The requestor or operations personnel must correct the identified problems and re-submit the request for processing.

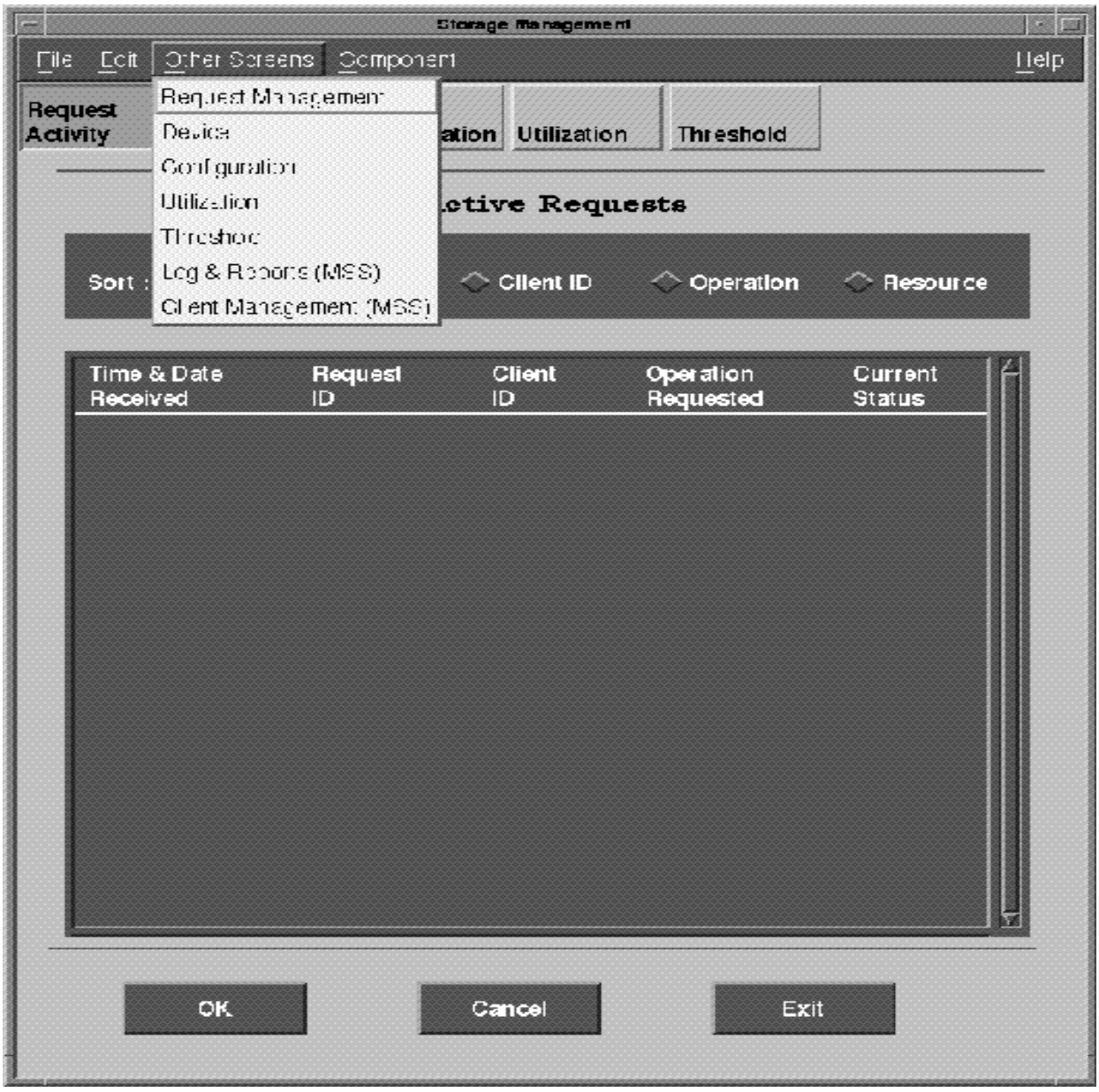

Figure 3.10.3.6-1. DSS System Management - Other Screens - Logs and Reports (MSS)

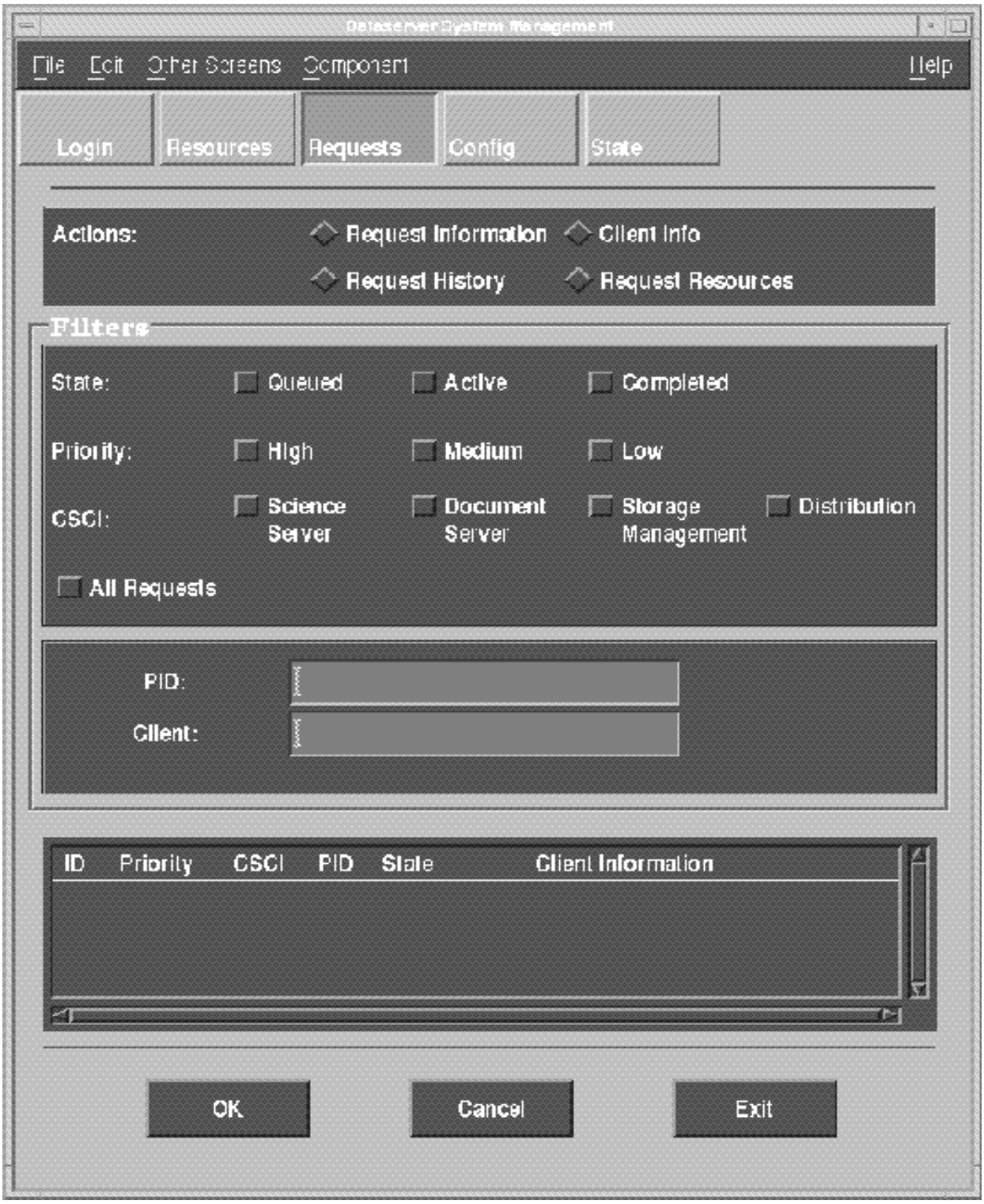

Figure 3.10.3.6-2. DSS System Management - Request

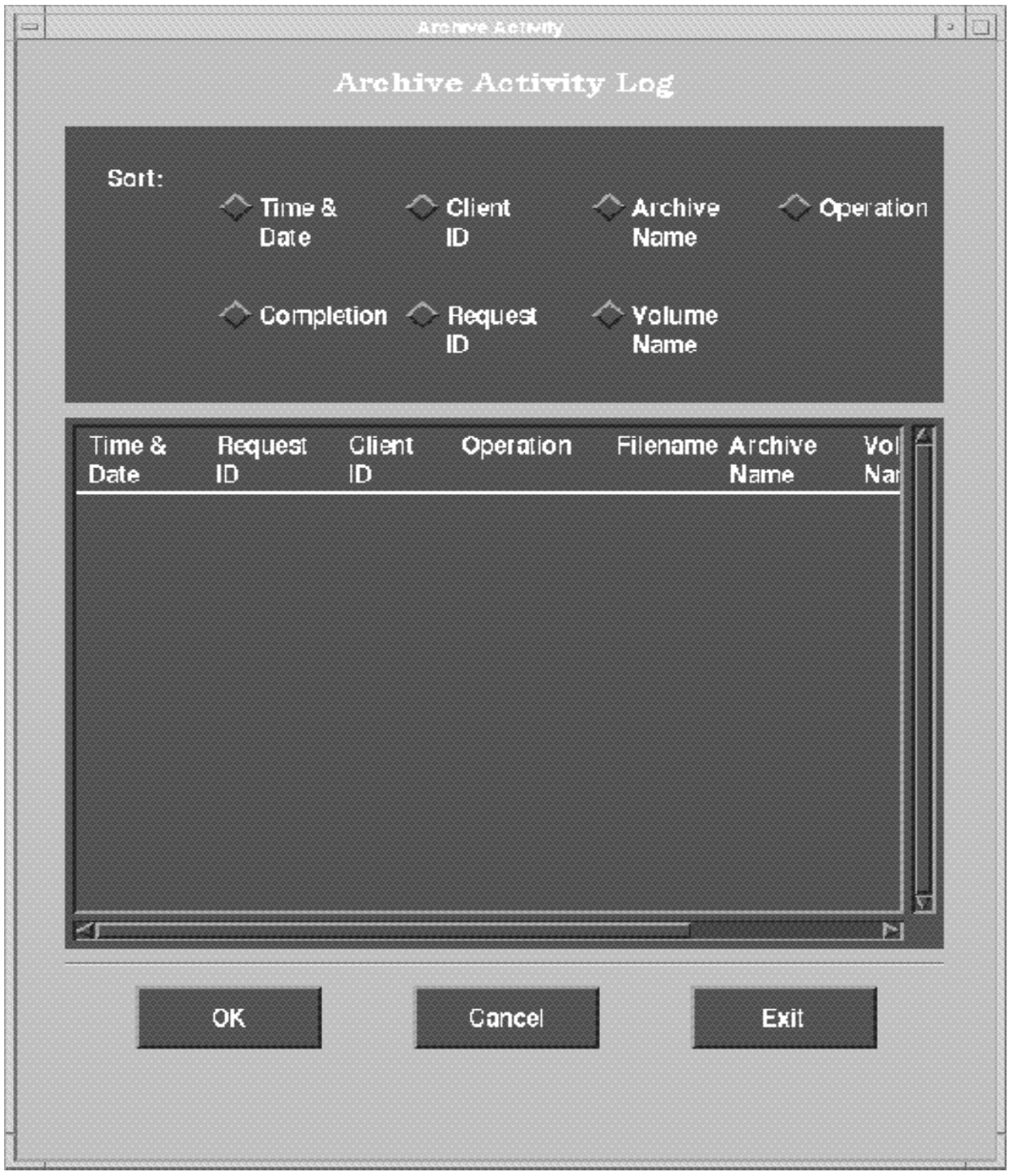

Figure 3.10.3.6-3. Storage Management - Archive Activity Log

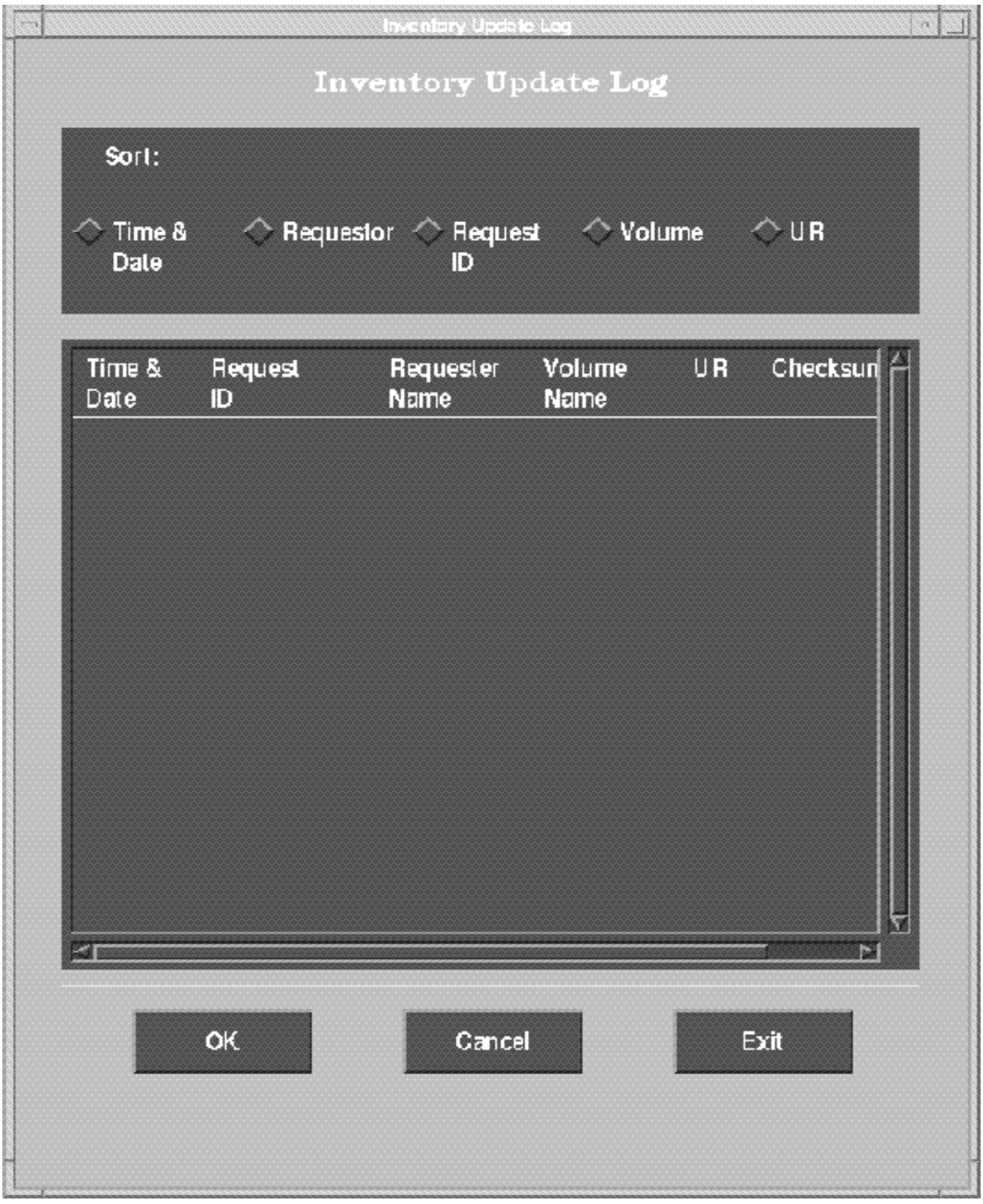

Figure 3.10.3.6-4. Storage Management - Archive Inventory Update

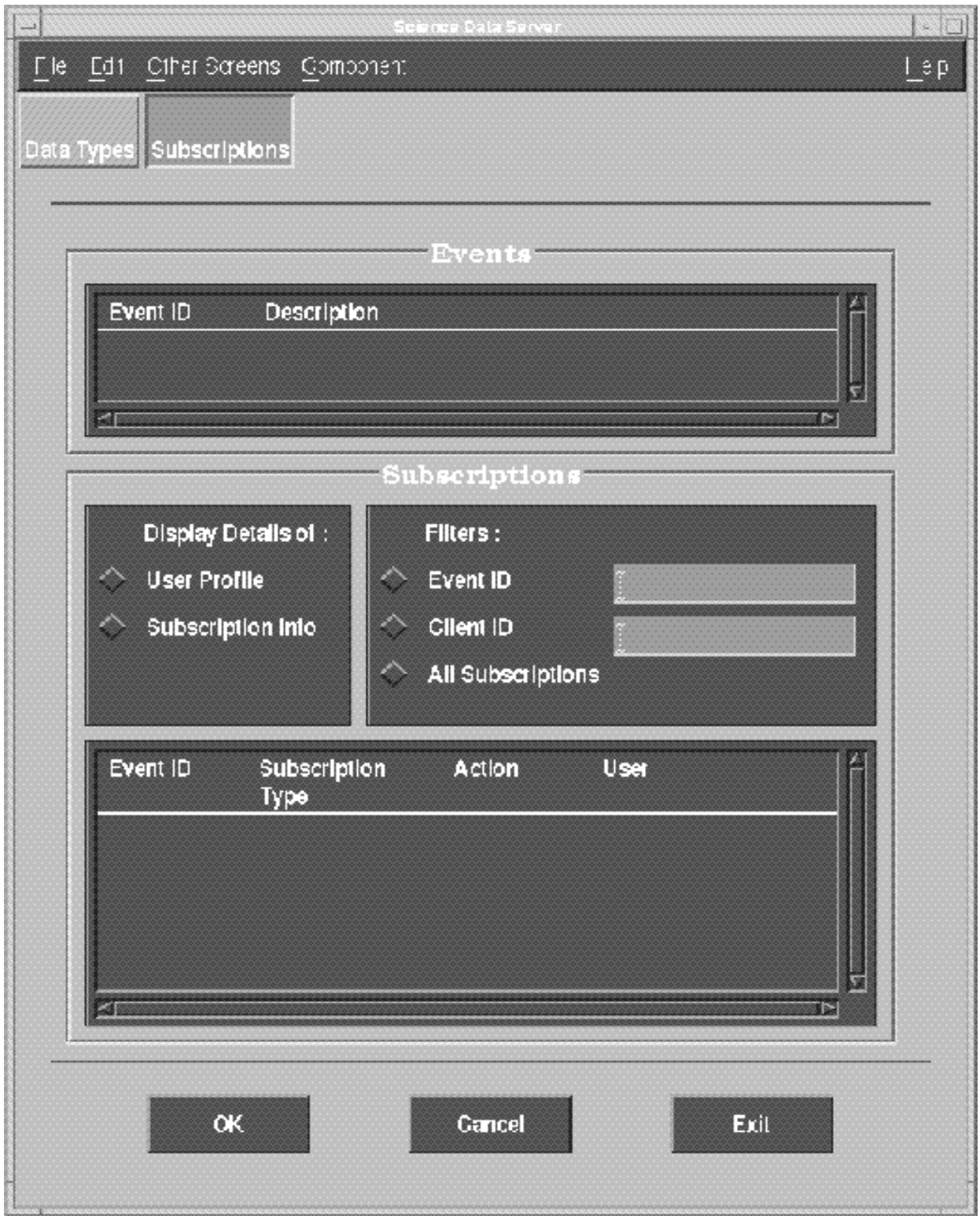

Figure 3.10.3.6-5. Science Data Server - Subscription Button

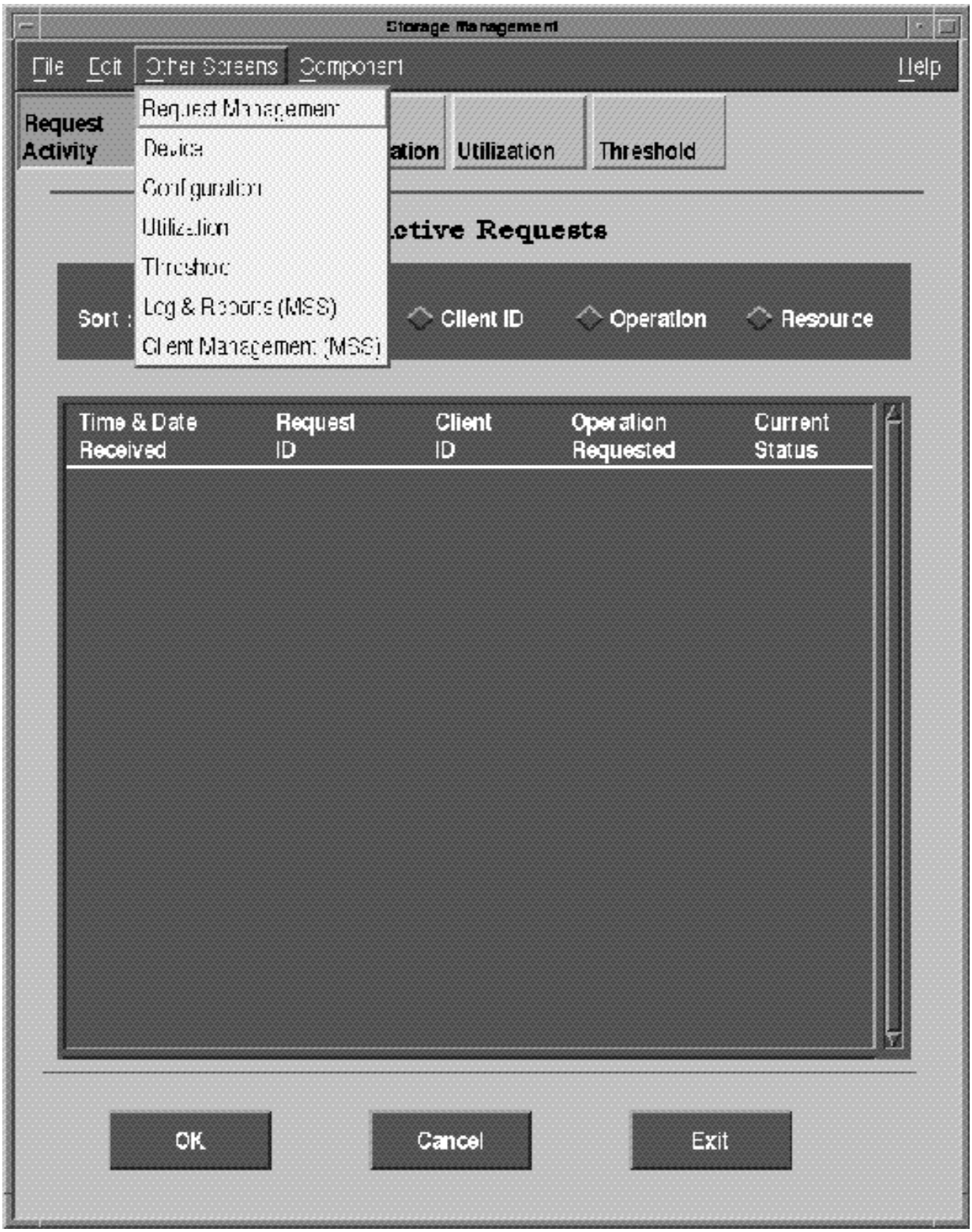

Figure 3.10.3.6-6. Storage Management - Main Menu

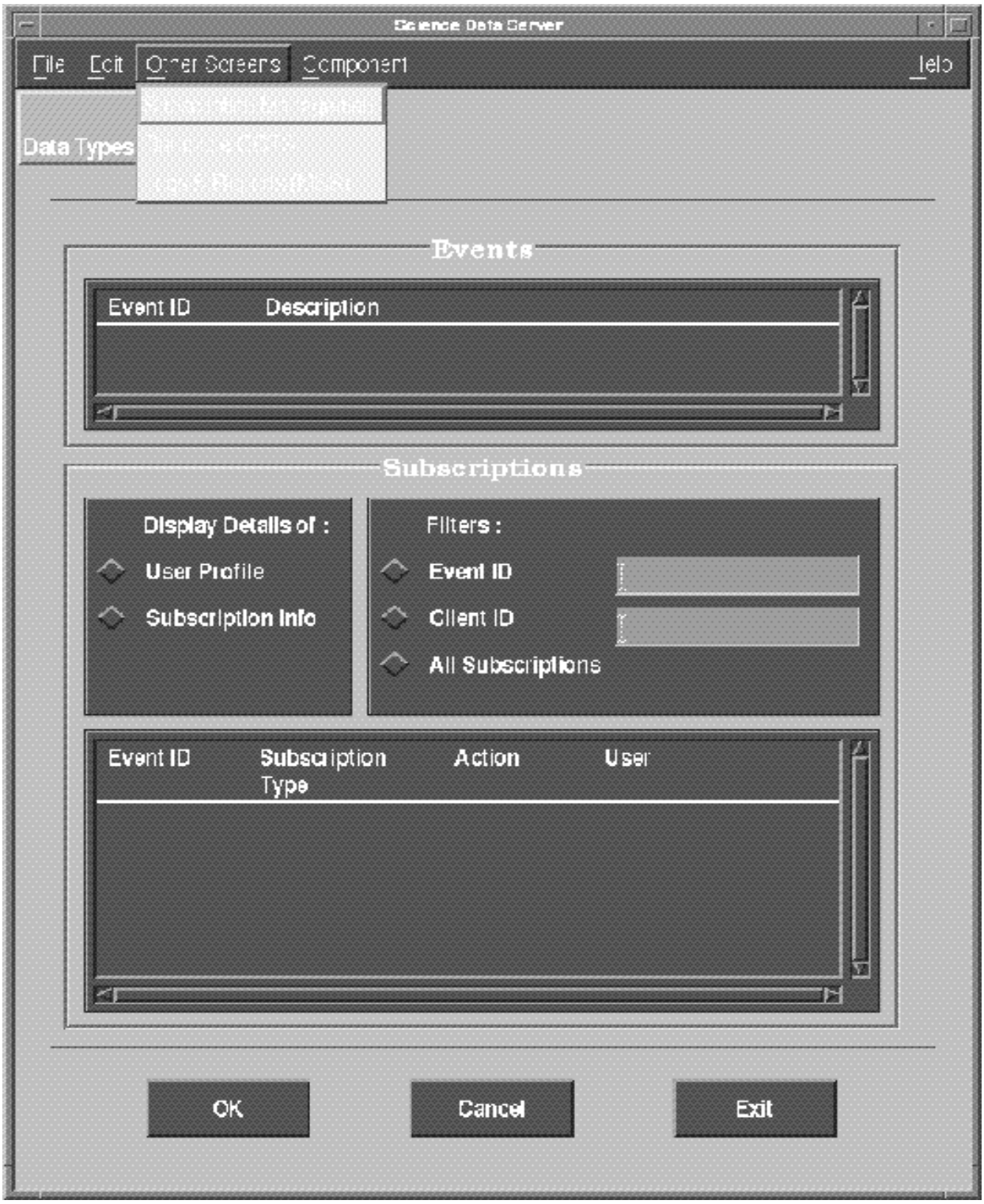

Figure 3.10.3.6-7. Science Data Server - Other Screens